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Attorney Docket No.: SP01-277

04/27/2009

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	10/053365	
Applicant	Daniel Warren Hawtof, et al	Confirmation No.: 2877
Filed	October 26, 2001	
Title	METHODS AND APPARATUS FOR PULSED DOPING OR DRYING A SOOT PREFORM	TC/A.U.: 1791

Examiner: Hoffmann, John M.

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT/RESPONSE TO FINAL OFFICE ACTION

Sir:

In response to the Office Action of March 9, 2009, please amend the above-identified as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 15 of this paper.

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The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously amended) A method of manufacturing an optical waveguide preform, said method comprising the steps of:
 - providing a first gaseous atmosphere including a first halogen-containing gas to a soot preform contained in a vessel, the first halogen-containing gas being selected from the group consisting of SiF₄, SF₆, CF₄, C₂F₆, COF₂, C₂F₂Cl₂, and F₂;
 - maintaining the first gaseous atmosphere between 1100 and 1300 °C, for a first reacting time sufficient to at least partially dope the soot preform, wherein the first halogen-containing gas has a partial pressure which decreases during the first reacting time, wherein no more than 0.5 slpm of the first gaseous atmosphere flows out of the vessel during the first reacting time, and wherein the first gaseous atmosphere is pressurized to a gage pressure of at least 0.1 atm gage during the first reacting time;
 - evacuating at least a portion of the first gaseous atmosphere from the vessel;
 - providing the vessel with a second gaseous atmosphere including a second halogen-containing gas, the second halogen-containing gas being selected from the group consisting of SiF₄, SF₆, CF₄, C₂F₆, COF₂, C₂F₂Cl₂, and F₂; and
 - maintaining the second gaseous atmosphere between 1100 and 1300 °C, for a second reacting time sufficient to further dope the soot preform, wherein the second halogen-containing gas has a partial pressure which decreases during the second reacting time, and wherein the second gaseous atmosphere is pressurized to a gage pressure of at least 0.1 atm gage during the second reacting time;
 - wherein the soot preform is retained in the vessel throughout and between: the step of maintaining the first gaseous atmosphere, the step of

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evacuating at least a portion of the first gaseous atmosphere, the step of providing the second gaseous atmosphere, and the step of maintaining the second gaseous atmosphere.

2. **(previously amended)** The method of Claim 1 further including, following said step of maintaining second gaseous atmosphere:

providing the vessel with a third gaseous atmosphere including a third halogen-containing gas; and

maintaining the third gaseous atmosphere in the vessel for a third reacting time sufficient to further dope the soot preform, wherein the third halogen-containing gas has a partial pressure which decreases during the third reacting time, wherein the soot preform is retained in the vessel throughout and between: the step of maintaining the second gaseous atmosphere, the step of providing the third gaseous atmosphere, and the step of maintaining the third gaseous atmosphere.

3. **(previously amended)** The method of Claim 1 including depressurizing the first gaseous atmosphere about the soot preform at the end of the first reacting time.

4. **(cancelled)**

5. **(cancelled)**

6. **(cancelled)**

7. **(previously amended)** The method of Claim 1 wherein an inert gas is added to the atmosphere in the vessel during and between said steps of maintaining the first gaseous atmosphere and maintaining the second gaseous atmosphere.

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8. **(previously presented)** The method of Claim 1 wherein a fluorine-containing gas selected from the group consisting of SiF_4 , SF_6 , CF_4 , C_2F_6 , COF_2 , $\text{C}_2\text{F}_2\text{Cl}_2$, and F_2 is added to the atmosphere in the vessel during at least one of the first and second reacting times.

9. **(previously amended)** The method of Claim 1 further including the step of at least partially purging the vessel prior to said step of providing the vessel with the second gaseous atmosphere.

10. **(previously amended)** The method of Claim 1 wherein:
additional dopant gas is added to the atmosphere in the vessel during at least one of the first and second reacting times to compensate for the decreases in the partial pressure of the dopant gas resulting from reaction of the dopant gas with the soot preform.

11. **(original)** The method of Claim 1 including pressurizing an outer surface of the vessel to offset pressurization within the vessel.

12. **(original)** The method of Claim 1 including supporting a reinforcing sleeve about the vessel during at least the first and second reacting times.

13. **(original)** The method of Claim 1 including rotating the soot preform relative to the vessel and wherein the vessel is sealed.

14. **(previously amended)** The method of Claim 1 including:
drying the soot preform prior to said step of providing the first gaseous atmosphere; and
sintering the soot preform following the second reacting time.

15. **(cancelled)**

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16. **(cancelled)**
17. **(previously amended)** The method of Claim 1 including:
wherein the first gaseous atmosphere has a first pressure during the first reacting time; and
wherein the second gaseous atmosphere has a second pressure during the second reacting time;
wherein the second pressure is different than the first pressure.
18. **(previously amended)** The method of Claim 1 including increasing a total pressure of the first gaseous atmosphere in the vessel during the first reacting time.
19. **(original)** The method of Claim 1 wherein the first reacting time is between about 1 and 60 minutes.
20. **(original)** The method of Claim 1 wherein the second reacting time is between about 1 and 60 minutes.
21. **(original)** The method of Claim 1 wherein the second reacting time is longer than the first reacting time.
22. **(cancelled)**
23. **(previously amended)** The method of Claim 1 wherein the temperature of the second gaseous atmosphere is different than the temperature of the first gaseous atmosphere.
24. **(cancelled)**

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25. (cancelled)

26. (cancelled)

27. (cancelled)

28. (cancelled)

29. (previously amended) The method of Claim 1 wherein the first and second gaseous atmospheres each include an inert gas selected from the group consisting of He, Ar, Ne, and N₂.

30. (previously amended) A method of manufacturing an optical waveguide preform, said method comprising the steps of:

providing a first gaseous atmosphere to a soot preform contained in a vessel, the first gaseous atmosphere including a fluorine-containing gas selected from the group consisting of SiF₄, SF₆, CF₄, C₂F₆, COF₂, C₂F₂Cl₂, and F₂;

maintaining the first gaseous atmosphere between 1100 and 1300 °C, for a first reacting time of between about 1 and 60 minutes to at least partially dope the soot preform, wherein the first fluorine-containing gas has a partial pressure which decreases during the first reacting time, wherein no more than 0.5 slpm of the first gaseous atmosphere flows out of the vessel during the first reacting time, and wherein the first gaseous atmosphere is pressurized to a gage pressure of at least 0.1 atm gage during the first reacting time;

evacuating at least a portion of the first gaseous atmosphere from the vessel at the end of the first reacting time; then

providing the vessel with a second gaseous atmosphere, the second gaseous atmosphere including a fluorine-containing gas selected from the group consisting of SiF₄, SF₆, CF₄, C₂F₆, COF₂, C₂F₂Cl₂, and F₂; and

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maintaining the second gaseous atmosphere between 1100 and 1300 °C, for a second reacting time sufficient to further dope the soot preform, wherein the second fluorine-containing gas has a partial pressure which decreases during the second reacting time, and wherein the second gaseous atmosphere is pressurized to a gage pressure of at least 0.1 atm gage during the second reacting time;

wherein the soot preform is retained in the vessel throughout and between: the step of maintaining the first gaseous atmosphere, the step of evacuating at least a portion of the first gaseous atmosphere, the step of providing the vessel with the second gaseous atmosphere, and the step of maintaining the second gaseous atmosphere .

31. (cancelled)

32. (previously amended) The method of Claim 30 including the step of depressurizing the first gaseous atmosphere about the soot preform at the end of the first reacting time.

33. (previously amended) The method of Claim 32 wherein the vessel is substantially completely gas-sealed throughout both of said steps of maintaining the first and second gaseous atmospheres.

34. (previously amended) The method of Claim 32 further including, following said step of depressurizing the doping atmosphere, the steps of:

replacing at least a portion of the first gaseous atmosphere with a second gaseous atmosphere about the soot preform, the second gaseous atmosphere being selected from the group consisting of SiF₄, SF₆, CF₄, C₂F₆, COF₂, C₂F₂Cl₂, and F₂; and

pressurizing the second gaseous atmosphere about the soot preform, and maintaining the second gaseous atmosphere between 1100 and 1300 °C, for a

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second reacting time of no more than 60 minutes to further dope the soot preform.

35. **(previously amended)** The method of Claim 34 wherein said step of pressurizing the second gaseous atmosphere includes pressurizing the second gaseous atmosphere to a gage pressure of at least 0.1 atm.

36. **(previously amended)** The method of Claim 35 wherein said step of pressurizing the second gaseous atmosphere includes pressurizing the second gaseous atmosphere to a gage pressure of at least 0.5 atm.

37. **(original)** The method of Claim 34 wherein the second reacting time is between about 5 and 30 minutes.

38. **(previously amended)** The method of Claim 34 wherein said step of pressurizing the second gaseous atmosphere includes heating the second gaseous atmosphere to a temperature of between about 1125 and 1300 °C.

39. **(previously amended)** The method of Claim 30 including pressurizing an outer surface of the vessel to offset the pressurizing within the vessel.

40. **(original)** The method of Claim 30 including rotating the soot preform relative to the vessel.

41. **(previously amended)** The method of Claim 30 including:
drying the soot preform prior to said step of providing the first gaseous atmosphere; and
sintering the soot preform following the first reacting time.

42. **(cancelled)**

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43. (cancelled)

44. (previously amended) The method of Claim 30 wherein the first gaseous atmosphere has a gage pressure of at least 0.5 atm gage.

45. (previously amended) The method of Claim 30 wherein the first reacting time is between about 5 and 30 minutes.

46. (cancelled)

47. (cancelled)

48. (cancelled)

49. (cancelled)

50. (cancelled)

51. (previously amended) A method of manufacturing an optical waveguide preform, said method comprising the steps of:

flowing a process gas into a vessel to provide a gaseous atmosphere in the vessel about a soot preform, the process gas including a first gas selected from the group consisting of SiF_4 , SF_6 , CF_4 , C_2F_6 , COF_2 , $\text{C}_2\text{F}_2\text{Cl}_2$, and F_2 ;

maintaining the gaseous atmosphere between 1100 and 1300 °C, for a reacting time sufficient to at least partially dope the soot preform, wherein the first gas has a partial pressure which decreases during the reacting time, wherein no more than 0.5 slpm of the gaseous atmosphere flows out of the vessel during the reacting time, and wherein the gaseous atmosphere is pressurized about the soot preform to greater than ambient pressure during the reacting time; and

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evacuating at least a portion of the gaseous atmosphere from the vessel at the end of the reacting time.

52. **(previously presented)** The method of claim 51 further including flowing a makeup gas into the vessel during the reacting time.

53. **(previously amended)** The method of claim 52 wherein the flow rate of the makeup gas is provided to at least partially offset for any pressure loss due to the first gas reacting with the preform.

54. **(cancelled)**

55. **(cancelled)**

56. **(previously amended)** The method of claim 51 including flowing an additional amount of the process gas into the vessel to form a second gaseous atmosphere in the vessel about the soot preform following said step of evacuating at least a portion of the gaseous atmosphere from the vessel, wherein the soot preform is retained in the vessel throughout and between the step of flowing the process gas into the vessel, the step of maintaining the gaseous atmosphere, the step of evacuating at least a portion of the gaseous atmosphere, and the step of flowing an additional amount of the process gas into the vessel.

57. – 131 **(cancelled)**

132. **(currently amended)** A method of manufacturing an optical waveguide preform, said method comprising the steps of:
providing a soot preform contained in a vessel;

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adding a quantity of a first gas to the vessel to provide a first gaseous atmosphere to the soot preform, the first gas being selected from the group consisting of SiF_4 , SF_6 , CF_4 , C_2F_6 , COF_2 , $\text{C}_2\text{F}_2\text{Cl}_2$, and F_2 ;

maintaining the first gaseous atmosphere between 1100 and 1300 °C, for a first reacting time sufficient to at least partially dope the soot preform, wherein the first gas has a partial pressure which decreases during the first reacting time, wherein the first gaseous atmosphere is pressurized to a first pressure greater than ambient pressure, and wherein no more than 0.5 slpm of the first gaseous atmosphere flows out of the vessel during the first reacting time; then

adding a quantity of a second gas to the vessel to provide a second gaseous atmosphere to the soot preform, the second gas being selected from the group consisting of SiF_4 , SF_6 , CF_4 , C_2F_6 , COF_2 , $\text{C}_2\text{F}_2\text{Cl}_2$, and F_2 ; and

maintaining the second gaseous atmosphere between 1100 and 1300 °C, for a second reacting time sufficient to at least partially dope the soot preform, wherein the second gas has a partial pressure which decreases during the second reacting time, wherein the second gaseous atmosphere is pressurized to a second pressure greater than ambient pressure, and wherein no more than 0.5 slpm of the second gaseous atmosphere flows out of the vessel during the second reacting time;

wherein the soot preform is retained in the vessel throughout and between the step of adding a quantity of a first gas, the step of maintaining the first gaseous atmosphere, the step of adding a quantity of a second gas, and the step of maintaining the second gaseous atmosphere.

133. **(previously presented)** The method of claim 132 wherein the vessel is sealed gas-tight throughout the first reacting time.

134. **(previously presented)** The method of claim 133 wherein the vessel is sealed gas-tight throughout the second reacting time.

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135. **(previously amended)** The method of claim 132 wherein at least a portion of the first gaseous atmosphere is evacuated from the vessel at the end of the first reacting time.

136. **(previously amended)** The method of claim 132 wherein at least a portion of the second gaseous atmosphere is evacuated from the vessel at the end of the second reacting time.

137. **(previously amended)** The method of claim 132 wherein no more than 0.1 slpm of the first gaseous atmosphere flows out of the vessel during the first reacting time.

138. **(previously amended)** The method of claim 132 wherein no more than 0.1 slpm of the second gaseous atmosphere flows out of the vessel during the second reacting time.

139. **(previously amended)** A method of manufacturing an optical waveguide preform, said method comprising the steps of:

providing a soot preform contained in a vessel;

adding a quantity of a first fluorine-containing gas to the vessel to provide a first gaseous atmosphere to the soot preform, the first gas being selected from the group consisting of SiF₄, SF₆, CF₄, C₂F₆, COF₂, C₂F₂Cl₂, and F₂; then,

sealing the vessel gas-tight and maintaining the first gaseous atmosphere between 1100 and 1300 °C, for a first reacting time sufficient to dope the soot preform, wherein the first gas has a partial pressure which decreases during the first reacting time as the soot preform is doped, wherein the first gaseous atmosphere is pressurized to a first pressure greater than ambient pressure during the first reacting time; then,

evacuating at least a portion of the first gaseous atmosphere from the vessel; then,

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adding a quantity of a second fluorine-containing gas to the vessel to provide a second gaseous atmosphere to the soot preform, the second gas being selected from the group consisting of SiF_4 , SF_6 , CF_4 , C_2F_6 , COF_2 , $\text{C}_2\text{F}_2\text{Cl}_2$, and F_2 ; then,

sealing the vessel gas-tight and maintaining the soot preform in contact with the second gaseous atmosphere within the vessel, and maintaining the second gaseous atmosphere between 1100 and 1300 °C, for a second reacting time sufficient to further dope the soot preform, wherein the second gas has a partial pressure which decreases during the second reacting time as the soot preform is doped, wherein the second gaseous atmosphere is pressurized to a second pressure greater than ambient pressure during the second reacting time;

wherein the soot preform is retained in the vessel throughout and between the step of adding a quantity of a first fluorine-containing gas, the step of sealing the vessel gas-tight and maintaining the soot preform in contact with the first gaseous atmosphere, the step of evacuating at least a portion of the first gaseous atmosphere from the vessel, the step of adding a quantity of a second fluorine-containing gas, and the step of sealing the vessel gas-tight and maintaining the soot preform in contact with the second gaseous atmosphere.

140. (previously amended) A method of manufacturing an optical waveguide preform, said method comprising the steps of:

providing a soot preform contained in a vessel;

adding a quantity of a first fluorine-containing gas to the vessel and in contact with the soot preform to provide a first gaseous atmosphere to the soot preform, the first gas being selected from the group consisting of SiF_4 , SF_6 , CF_4 , C_2F_6 , COF_2 , $\text{C}_2\text{F}_2\text{Cl}_2$, and F_2 ; then,

interrupting the adding of the first fluorine-containing gas into the vessel and maintaining the soot preform in contact with the first gaseous atmosphere within the vessel, and maintaining the first gaseous atmosphere between 1100 and 1300 °C, for a first reacting time sufficient to dope the soot preform, wherein the first gas has a partial pressure which decreases during the first reacting time as the soot preform is doped,

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wherein the first gaseous atmosphere is pressurized to a first pressure greater than ambient pressure during the first reacting time; then,

evacuating at least a portion of the first gaseous atmosphere from the vessel; then,

adding a quantity of a second fluorine-containing gas to the vessel to provide a second gaseous atmosphere to the soot preform, the second gas being selected from the group consisting of SiF_4 , SF_6 , CF_4 , C_2F_6 , COF_2 , $\text{C}_2\text{F}_2\text{Cl}_2$, and F_2 ; then,

interrupting the adding of the second fluorine-containing gas into the vessel and maintaining the soot preform in contact with the second gaseous atmosphere within the vessel, and maintaining the second gaseous atmosphere between 1100 and 1300 °C, for a second reacting time sufficient to further dope the soot preform, wherein the second gas has a partial pressure which decreases during the second reacting time as the soot preform is doped, wherein the second gaseous atmosphere is pressurized to a second pressure greater than ambient pressure during the second reacting time;

wherein the soot preform is retained in the vessel throughout and between the step of adding a quantity of a first fluorine-containing gas, the step of interrupting the adding of the first fluorine-containing gas and maintaining the soot preform in contact with the first gaseous atmosphere, the step of evacuating at least a portion of the first gaseous atmosphere from the vessel, the step of adding a quantity of a second fluorine-containing gas, and the step of interrupting the adding of the second fluorine-containing gas and maintaining the soot preform in contact with the second gaseous atmosphere.

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REMARKS/ARGUMENTS

Claims 1-3, 7-14, 17-21, 23, 29-30, 32-41, 44-45, 51-53, 56, and 132-140 remain in this application. Claim 132 has been amended. Claims 4-6, 15-16, 22, 24-28, 31, 42-43, 46-50, 54-55, 57-131 have been cancelled.

1. § 103 Rejections

The Examiner has rejected claims 1-3, 7-14, 17-21, 23, 29-30, 32-41, 44, 45, 51-53, 56 and 132-140 under 35 U.S.C. § 103(a) as being unpatentable over Kyoto (5158587) alone, or in view of Walker (4178347), Dobbins (5043002), Biswas (4575463), Simms (4339256) and Korenowski (4118295).

According to the Examiner, "Example 2 of Kyoto discloses the providing step and all of the contacting, except for the flow rate limitation and the decreasing partial pressure. Kyoto's example 2 also does not disclose the evacuating and refilling. However, based on col. 2, line 63 and example 1, Kyoto also teaches doping without any gas flowing out. Alternatively, it would have been obvious to have no gas flowing out, because if any gas flows out, the pressure is not being maintained." (Final Office Action, page 3).

In response to Applicant's previous arguments, the Examiner noted, "the rejection also does make a reasonable case that Kyoto (alone) establishes inherency . . . Since the gas does not flow out, and since fluorine is leaving the gas and entering the preform, there are fewer atoms of fluorine in the gas thus the partial pressure would necessarily/inherently decrease." (Final Office Action, page 8).

Applicants submit that this rejection is traversed. As stated in the MPEP, "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" (MPEP § 2112, citing *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

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In arguing that Kyoto inherently meets claim 1, the Examiner points to Example 1 and col. 2, line 63 of Kyoto. However, neither of these portions of Kyoto results in a partial pressure of a first halogen-containing gas that decreases during a first or a second reaction time. Example 1 of Kyoto states that "a pure silica soot preform was heated in the vessel 3 containing pure SiF_4 under pressure of 4 atm. at $1,100^\circ\text{C}$. for 2 hours . . ." (Kyoto, col. 4, ll. 16-18). Thus, contrary to the Examiner's assertion, Example 1 indicates that the pressure of pure SiF_4 was maintained at 4 atm for 2 hours. Nothing in this example indicates that the pressure of SiF_4 was allowed to decrease, let alone that the pressure of SiF_4 in the vessel would necessarily decrease as a result of practicing this example.

Similarly, col. 2, line 62 of Kyoto merely states that "[p]referably, SiF_4 is flowed into the atmosphere." Even assuming *arugendo* that this statement can be construed as contemplating embodiments wherein SiF_4 is and is not flowed into the atmosphere, such does not establish a *prima facie* case of inherency. Specifically, regardless of whether SiF_4 is flowed into the atmosphere, such would not necessarily result in a partial pressure of a first halogen-containing gas that decreases during a first or a second reaction time. In any such event, a compensating amount of SiF_4 gas can be added to the reaction vessel such that the partial pressure of SiF_4 at least remains constant.

In fact, continuously adding a compensating amount of SiF_4 so as to maintain a constant partial pressure of SiF_4 (and a constant reaction rate) is precisely what Kyoto consistently and repeatedly teaches (see, e.g., Kyoto, col. 4, ll. 30-32 ("porous silica glass deposited around the core was heated at $1,100^\circ\text{C}$ under 2 atm. for one hour with flowing SiF_4 at a rate of 2 l/min); col. 3, ll. 43-44 ("By continuously providing fresh SiF_4 in the vessel an optimum reaction rate can be maintained."); col. 4, ll. 48-51 ("When SiF_4 is continuously flowed during the addition of fluorine to the porous soot preform, the reaction rate of fluorine is not decreased and less bubbles are formed in the preform.")).

Nonetheless, the Examiner argues that Kyoto's teachings regarding continuously flowing fresh SiF_4 merely constitute preferred embodiments, whereafter the Examiner

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cites MPEP § 2123 regarding the prior art effect of disclosed but nonpreferred embodiments. However, this section (and the cases cited therein) presupposes that there is a disclosed but not preferred embodiment from which to base the rejection. Here, no such embodiment has been provided. Specifically, the Examiner has not shown that any embodiment of Kyoto teaches or necessarily results in all of the claimed limitations of any independent claim.

To the contrary, several limitations of independent claim 1 (and other independent claims) are not taught or suggested by any embodiment of Kyoto. For example, Kyoto fails to teach or suggest that no more than 0.5 slpm of a first gaseous atmosphere flows out of a vessel during a first reacting time. Kyoto also fails to teach or suggest a first halogen-containing gas that has a partial pressure which decreases during a first reacting time. In addition, Kyoto fails to teach or suggest evacuating at least a portion of a first gaseous atmosphere from a vessel. Moreover, Kyoto does not teach or suggest providing a vessel with a second gaseous atmosphere including a second halogen-containing gas nor does it teach that the second halogen-containing gas has a partial pressure which decreases during the second reacting time. Accordingly, at least this combination of steps outside of the disclosure of Kyoto would be required in order to meet the recitation of, e.g., claim 1.

In response to Applicants' arguments that no motivation has been provided to make this combination of modifications to Kyoto and, in particular that no motivation has been provided to modify the teachings of Kyoto to provide for decreasing the partial pressure of a halogen-containing gas during a reacting time, the Examiner noted, "[i]t is also argued that the relevant issue is whether there is motivation to modify Kyoto to allow the decrease of the partial pressure. Applicant concludes there is no motivation because it . . . would make the process unsatisfactory for its intended purpose. Examiner cannot agree at least because Applicant has not pointed out any intended purpose and why the modification would make the process unsatisfactory. It seems clear to Examiner the purpose is to dope the preform. This purpose would clearly result from the proposed modification." (Final Office Action, page 10).

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Applicants submit that modification of Kyoto to provide for decreasing partial pressure of a halogen-containing gas during reaction would render Kyoto unsatisfactory for its intended purpose because Kyoto teaches that an intended purpose of his invention "is to provide a method for producing a glass preform containing fluorine in an increased amount with fewer or no bubbles therein." (Kyoto, col. 2, ll. 45-48). Kyoto teaches that this object is achieved by maintaining a constant or non-decreasing reaction rate, which in turn is achieved by maintaining a constant or non-decreasing amount of SiF_4 reactant in the reaction vessel (*see e.g.*, Kyoto, col. 4, ll. 48-51 ("When SiF_4 is continuously flowed during the addition of fluorine to the porous soot preform, the reaction rate of fluorine is not decreased and less bubbles are formed in the preform."); *see also* Kyoto, col. 3, ll. 43-50). Accordingly, modification of Kyoto to allow the partial pressure of SiF_4 to decrease during reaction would lead to a decrease in the reaction rate at constant temperature, resulting in an increase in bubbles formed in the preform, thereby rendering Kyoto unsatisfactory for its intended purpose.

In response to the rejections that include reliance on secondary references, Applicants' reiterate arguments made previously. Specifically, Applicants submit that Walker, Dobbins, Simms and Korenowski each relate to non-analogous art and, in addition, persons having ordinary skill in the art would not have been motivated to combine Kyoto with Dobbins, for at least the reason that use of a halide-free source as taught by Dobbins (i.e., complete replacement of a halide-containing reactant) would render Kyoto unsatisfactory for its intended purpose because Kyoto specifically emphasizes the use of SiF_4 .

In addition, persons having ordinary skill in the art would not have been motivated to evacuate at least a portion of a first gaseous atmosphere from a vessel and then provide the vessel with a second gaseous atmosphere in view of Biswas. Biswas relates to the application of a primary and secondary coating on an already drawn optical fiber and persons having ordinary skill in the art would not have been motivated to apply processing conditions relevant to applying coatings onto drawn fiber onto processing conditions for fiber preforms.

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Accordingly, Applicants submit that independent claims 1, 30, 51, 132, 139, and 140 are patentable over the cited references. Applicants further submit that all claims depending from these claims are patentable over the cited references.

Moreover, Applicants submit that claim 18 is patentable over the cited references for at least the reasons discussed above and for the additional reason that Kyoto teaches away from the reaction set forth in equation 2 (Kyoto, col. 3, ll. 43-47 ("By continuously providing fresh SiF₄ in the vessel an optimum reaction rate can be maintained. This may be due to the fact that the dissociation reaction represented by the following reaction formula (2) could be suppressed.")).

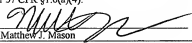
Based upon the above amendments, remarks, and papers of records, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant believes that no extension of time is necessary to make this Reply timely. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Matthew J. Mason at 607-974-9993.

Respectfully submitted,

DATE: 4/24/09
Matthew J. Mason

CERTIFICATE OF MAILING OR TRANSMISSION I hereby certify that this paper and/or fee or charge authorization is being transmitted to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 24, 2009 via: <input checked="" type="checkbox"/> the Electronic Filing System of the U.S. Patent and Trademark Office under 37 CFR § 1.6(a)(4). Signature  Matthew J. Mason
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